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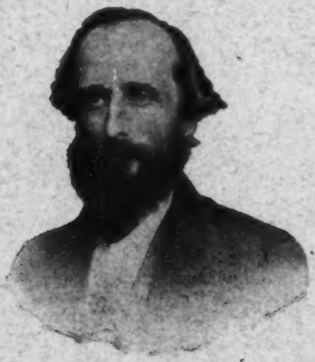

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1828-1895.

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Emily L. Morton

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXVIII. MARCH, 1917. NO. 3.

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Emily L. Morton.

By H. H. NEWCOMB, Venice, California.

(Plate VIII.)

It was nearly twenty years ago that I first met Emily L. Morton. I had become much interested in her work of hybridizing the Saturniidae and accepted with great pleasure her invitation to New Windsor on the Hudson, to see her collection and to hear her own account of her experiments.

What a delightful visit that was, and what a wonderful collection she had. Since then we have become well acquainted and I am able to give a few of the more interesting events of her life.

Miss Morton was born at Rocklawn, New Windsor, New York, on the 3rd of April, 1841, in the old mansion which was built upon land that belonged to her mother's family for four generations. She and her sister still live there, the sole survivors of the family. Her father was Edmund Morton, her mother was Caroline M. Ellison, both of the city of New York.

As a very small child her entomological fancies asserted themselves; she would spend hours sitting by an ant-hill watching the little insects running in and out. She would chase butterflies and, much to her mother's horror, bring home caterpillars and other "bugs."

When she was thirteen years old she was presented with a copy of Kirby and Spence by her cousin, Dr. John W. Green. He was much interested in her longing to obtain some knowledge of the life-histories of insects and took this method of helping her. She pored over the work day and night, learning it almost by heart, although it was very scientific, and she did not know even the common names of most of the insects described. She has since tried to read this book and wonders how a child could ever have mastered its contents, for a drier and heavier work could hardly be found.

About the year 1860 another cousin, Robert R. Ellison, made a small collection of Lepidoptera and Coleoptera, and while helping him she started her own collection, gathering promiscuously everything in the line of insects.

With no books, except Kirby and Spence, no knowledge of names or terms, and no one to consult, it was uphill work; still she persevered until she came across an antiquated book with a few figures of insects, uncolored and poorly drawn. This, however, helped her a little until one happy day she procured a copy of Harris' *Insects Injurious to Vegetation,* and from this most valuable work she was able to name most of the insects she had collected.

Then Col. Thomas Arden, United States Army, presented her with nine volumes of the Agricultural Reports of New York. Scattered throughout these books were articles by Asa Fitch, then State Entomologist, and from these she extracted an immense amount of interesting and instructive information, which added greatly to her love for the study.

Soon after this she met Valentine W. Andrews, then agent for the *Canadian Entomologist,* who told her that at the Astor Library, in New York City, she would find that wonderful work on Lepidoptera, Smith & Abbot's *Insects of Georgia.*

Upon her next visit to that city she hastened to the library to see these treasures, and the good-natured librarian, noting her eagerness, installed her in an alcove, telling her she could study them there any time she was in town.

Through the *Canadian Entomologist* she became acquainted with W. H. Edwards, with whom she worked out the life-history of that curious little butterfly, *Feniseca tarquinius*. It was she who discovered the larval habits of this insect on one of her expeditions among the swamp-alders. She found the caterpillar living within the masses of the downy plant-lice, which swarm upon this tree.

From Miss Morton's letters, Edwards has written in the *Canadian Entomologist* a full account of the early stages of this interesting insect, the plates having been drawn by Mrs. Peart, of Philadelphia, showing the curious woolly larva and the little monkey-faced chrysalis.

In 1883 Miss Morton met Henry Edwards, who proved a very kind and interesting gentleman, and greatly assisted her with names and other facts. He was a most amusing and entertaining visitor, enthusiastic and in raptures over the many new specimens he caught while on a visit to her home. He was a noted tragedian and after his death his splendid collection of Lepidoptera was purchased by his company for the benefit of his widow and presented to the Museum of Natural History at New York City.

Among Miss Morton's friends was Prof. A. S. Packard, Jr., who was a kind and courteous correspondent. She drew and painted many larvae for his contemplated work on North American Lepidoptera and she possessed a copy of his beautiful work on the Geometridae, of which group she had a large assortment.

Another friend of hers was Samuel H. Scudder and considerable correspondence passed between them relative to his work of changing the old Linnean generic names, which she considered a grave mistake. In spite of their disagreement they remained firm friends until he passed away.

She also met Herman Strecker and colored for him many

of the plates of his famous work on the Lepidoptera. He told her that unless he succeeded in selling his magnificent collection for $20,000 he would leave it to the British Museum. As a matter of fact it was purchased after his death by the Field Columbian Museum at Chicago.

Miss Morton considers her experiments in rearing hybrids of the Saturnidae her most interesting and important work. The first moths which she succeeded in crossing were *Samia cecropia* ♀ with the western *gloveri* ♂. These produced the most beautiful progeny of any of her trials, being larger than either of the parents, beautifully colored in crimson and gray.

Afterwards she successfully crossed *cecropia* with *ceanothi* and with *columbia*. Cocoons of the latter species were sent to her by her friend, James L. Mitchell, of Battle Creek, Michigan, which were searched for by him with infinite patience in the larch swamps of that locality.

Our *luna* paired with the Asiatic *selene* and produced splendid great moths, retaining the shape of the latter, but having the delicate color of the *luna*. In every case the progeny of these matings proved infertile.

Eight of these hybrids she sold to Baron Rothschild for $40, and this was the only money she ever made from her life-long work on Entomology.

Among her many accomplishments was that of cabinet-maker. For her collection she made a big cabinet of sixty drawers, arranged in three tiers, doing even the glazing herself. Besides this, she made innumerable boxes for the surplus odds and ends of her collection.

Twice Mrs. Newcomb and myself have had the very great pleasure of visits from her to our home, which was then at Dorchester, Massachusetts, and I shall always remember the keen enjoyment of a day spent with her roaming the Blue Hills of Milton with our nets.

In 1904 she wrote me that her collection was becoming too great a care and that if I wished I might have it. What a wonderful thing to have a collection like hers to add to my own modest efforts in that line. I immediately went to New Windsor and together we packed it up and it was sent to my home.

I soon found that I had more Lepidoptera than I could well handle, so the Geometridae were taken by Louis W. Swett, who is working in that group, and the Noctuidae by the American Museum of Natural History, New York City.

The remainder of her collection is now at the Boston Society of Natural History, under the care of its efficient curator, Charles W. Johnson.

Miss Morton begged me not to forget to mention her very dear friends, Mrs. Herring and the late Mrs. Gilbert, both of Plainfield, New Jersey, and the delightful two weeks spent with them at a hotel at Liberty, New York. They used to hire the Liberty stage and go on collecting trips in that beautiful section, where many rare specimens were taken.

Miss Morton has lived an active, industrious life and although she has written very little for scientific publications, her work was of the practical, useful kind and her best efforts were devoted to helping others in their entomological studies and pursuits.

(The photograph from which Plate VIII was made was taken about thirty or thirty-five years ago.)

The Azalea Lace-Bug, Stephanitis pyrioides Scott (Tingitidae, Hemiptera).

By Edgar L. Dickerson and Harry B. Weiss.*

(Plate IX.)

For the past several years this tingid has been present in New Jersey, but only recently has it become abundant and widespread enough to do considerable damage. It was originally described by John Scott in his paper "On a Collection of Hemiptera Heteroptera from Japan, Descriptions of Various New Genera and Species," which appeared in the Ann. Mag. Nat. His. (4) XIV, p. 440. 1874. Horvath, in the Ann. Mus. Hung. III. p. 568, 28 (1905) et IV. p. 55, 3 (1906), contributed to synonymy by renaming it *Stephanitis azaleae*. In Van Duzee's check list of the Hemiptera of America, north of Mexico, it appears as *Stephanitis pyrioides* Scott.

*The arrangement of the authors' names is alphabetical only and indicates neither seniority nor precedence.

It has been found by the authors at the following localities in New Jersey: Arlington, Rutherford, Far Hills, Riverton, Palmyra, Springfield, Nutley and New Brunswick, and is also known to occur at Bala, Pennsylvania; Washington, D. C.; Holland and Japan. It was evidently introduced into New Jersey in the egg stage on evergreen azaleas from Japan, as quite a few Japanese azaleas have been imported into New Jersey during the past few years. We have found it infesting the following species and varieties of azaleas: Hinodegeri, Amoena, Ledifolia alba, Benigeri, Yodogawa, Kaempheri, Pontica, Mollis, Indica, Shirogeri, Hatsugeri, Shibori, Amurasaki, Schilippenbachii, etc., the deciduous varieties, however, not being as badly infested as the evergreen ones.

The injury is caused by the nymphs and adults feeding on the under surfaces of the leaves, abstracting the sap and resulting in a discoloration of the foliage on the upper surface. In severe infestations, the leaves become almost white, many of them drying completely and dropping off, and the undersides of the leaves are also disfigured by the excrement of the insects.

The winter is passed in the egg stage and hatching takes place about the latter part of May in central and southern New Jersey. The length of each nymphal stage varies from three to six days, depending on the temperature. About the latter part of June adults appear and egg-laying takes place, this operation extending over an average period of two weeks. These eggs require on an average two weeks for hatching and by the last week in July and first week of August growth is completed and many new adults are present. During the first two weeks of August eggs are again laid and by the middle and last week in September many adults of this brood are present, the over-wintering eggs being deposited at this time and during the first part of October. Adults, mostly females, have been noted lingering on the plants as late as the middle of November. Thus there are three broods in southern New Jersey, the average length of each being about one month. In the central and northern parts of the State there are only two, and a partial third. On account of the extended oviposition

period it is quite possible to find all stages feeding together at the same time.

About the time the maximum number of adults have emerged the proportion of sexes is equal. Later, however, many of the males disappear and about the time egg-laying is well under way the females are in the majority. As it approaches time for the hatching of the eggs the adults lingering on the plants are practically all females. It thus appears that either the females have greater vitality or that the males die soon after copulation. Egg-deposition requires from two to three minutes. The ovipositor is pulled from its sheath and the female touches the surface of the leaf with it until a suitable place is found. It is then thrust into the tissue until the abdomen rests against the leaf and then withdrawn.

Egg & Nymphal Stages.

Egg. Length 0.4 mm., width 0.18 mm. These are smooth, white and flask-shaped, with the neck bent to one side. They are deposited in the leaf tissue along the mid-rib and larger veins, being found as a rule in the younger leaves. Each egg is inserted in the tissue with the cap extending slightly above the leaf surface, each cap being visible as a whitish oval or irregular circular ring. Sometimes, but not always, the cap is covered with a brownish scab-like crust. From one to ninety eggs have been found in a single leaf, most of them being placed irregularly along the mid-rib. In many leaves, the eggs can readily be located by holding the leaf up to the light and examining with a hand lens, each egg appearing as a light oval spot surrounded by a reddish or dark discoloration.

1st Nymphal Stage. Length exclusive of tubercles 0.4 mm. Body elliptical, slightly broadest at middle of abdomen. General color white except tips of ultimate and penultimate antennal segments, bases of legs, line on front of head extending to base of rostrum, middle dorsal surface of abdomen and tubercles on head and abdomen which are brownish. Two tubercles on posterior margin of head, one on vertex in front and between them. One median dorsal tubercle on the 2nd, 5th, 6th and 8th abdominal segments. Antennae three-fifths the length of the body. Rostrum extending to last pair of legs. Eyes lateral, not prominent, consisting of five distinct ommatidia. Antennae and tubercles in this and the following nymphal stages covered with secreting hairs.

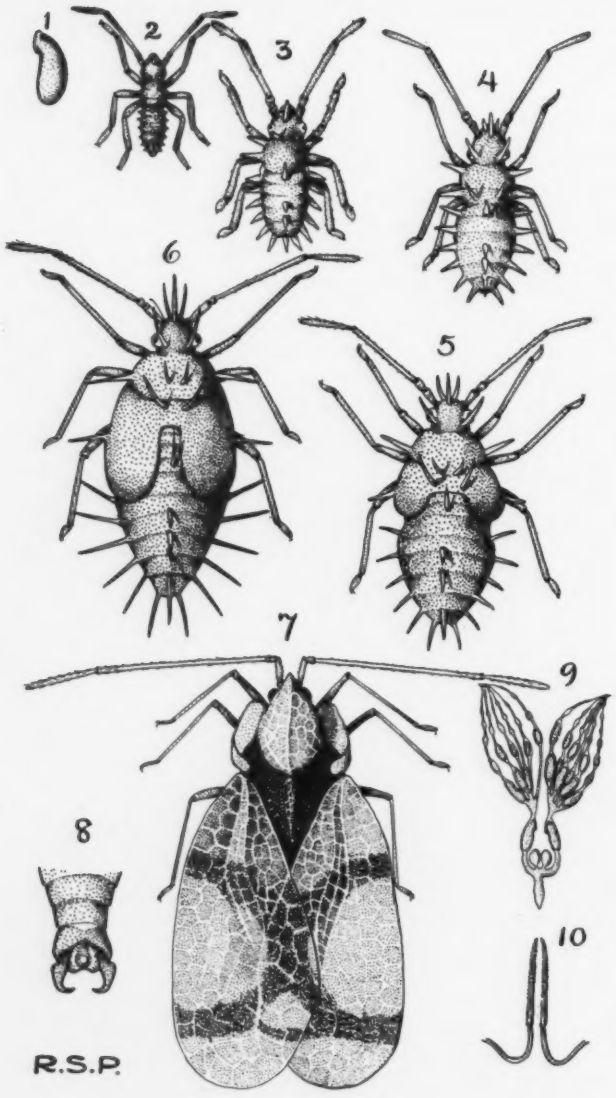
2nd Nymphal Stage. Length exclusive of tubercles 0.55 mm. Body elliptical, color white except tips of ultimate and penultimate antennal

segments, line on front of head, tubercles, bases of legs, dorsal surface of abdomen and bands extending anteriorly near sides of thorax, which are brownish. Tubercles as noted before in first stage, but more pronounced and in addition, single pointed tubercles on sides of pro- and mesothorax, on sides of 4th, 5th, 6th, 7th, 8th, 9th abdominal segments and two minute tubercles on face just below vertex. Rostrum extending to last pair of legs. Eyes similar to those of first nymphal stage. Antennae three-fifths length of body.

3rd Nymphal Stage. Length exclusive of tubercles 0.8 mm. Similar to second stage except that coloring and structure are more pronounced. Body elliptical, color white except tips of ultimate and penultimate antennal segments, line on front of head, bases of legs, dorsal surface of abdomen, posterior lateral sides of thorax, some of posterior and lateral margins of head and tubercles which are brownish. Dorsal surface of abdomen and tubercles darker brown than remainder. Tubercles similar to preceding stage but more pronounced and in addition two white median dorsal tubercles on pro- and mesothorax. Tubercles on sides of mesothorax rest on basal lobes. Eyes similar to preceding stage. Antennae tending toward yellowish white, three-fifths length of body. Rostrum extending to last pair of legs.

4th Nymphal Stage. Length exclusive of tubercles 1.2 mm. Body broadly elliptical. Color white except tips of ultimate and penultimate antennal segments, line on front of head, bases of legs, most of dorsal surface of abdomen, posterior two-thirds of thorax, portions of lateral and posterior margins of head, outer sides of basal segments of antennae, outer surfaces of tarsi, rostrum and tubercles, which are brown. Antennae yellowish brown. Median dorsal tubercles on prothorax white except at tips. Tubercles similar to those of third stage but more pronounced. Lobes of mesothorax more pronounced, covering those of metathorax. Antennae about three-fifths length of body. Rostrum extending to third pair of legs. Eyes consisting of numerous ommatidia.

5th Nymphal Stage. Length exclusive of tubercles 1.8 mm. Body oval. Color: antennae light yellowish brown; line on front of head and portions of lateral and posterior margins of head, posterior margins of pro-thorax, most of meso- and metathorax, basal three-fourths of abdomen, base and tips of wing pads, tubercles, outer surface of basal antennal segments, tips of ultimate and penultimate antennal segments, bases of legs, bases of tarsi, outer surface of rostrum, brown; remainder white in part tinged with brown. Tubercles very pronounced, acuminate. Wing-pads extending to 5th abdominal segment. Eyes more prominent, consisting of numerous reddish ommatidia. Median dorsal elevation on prothorax. Rostrum extending between 2nd and 3rd pair of legs. Antennae almost as long as the body.



AZALEA LACE-BUG, STEPHANITIS PYRIOIDES—DICKERSON AND WEISS.

Adult. This was described by Scott from one example as follows:

Tingis pyrioides. Extremely like *Tingis pyri* in nearly every particular: and therefore it will only be necessary to point out the characters which will separate them.

Tingie pyri Fab. Disk of the elytra from the apex of the rhomboidal cell with 5 transverse rows of irregular meshes.

Tingis pyrioides. Disk of the elytra from the apex of the rhomboidal cell with 3 transverse rows of irregular meshes. Pronotum, lateral margins more upright than in *T. pyri.* Length 1 and 1/2 line.

As a matter of information the original description of *Tingis pyri* by Fabricius in Systema Entomologiae (1775). p. 696, is given as follows:

Acanthia pyri thorace trialato, scutello foliato, elytris reticulatis, basi gibbis.

Habitat in foliorum pyri pagina inferiori, ea maculans. Prof. Herrmann. Caput parvum, albidum. Thorax alis tribus magnis, elevatis, albis, fusco-reticulatis; lateralibus compressis, carinatis, acutis; intermedia globosa, breviora. Scutellum elevatum, foliaceum, acutum, album, macula fusca baseos. Elytra reticulata, alba, fusco-maculata, basi gibba. Pedes albi.

On the accompanying plate will be found figures of the egg, nymphal stages, adult, anal claspers of male, ovipositor and ovaries. Each ovary was found to consist of six tubes, some of which were empty, while others contained mature and immature eggs. The mature eggs in the oviduct showed slight brown discolorations at the upper ends. As shown in the figure, a seminal receptacle was found slightly on the ventral side of each oviduct.

These lace bugs may be controlled on azaleas by spraying with whale oil soap at the rate of 5 or 6 pounds to 50 gallons of water. To be most effective the spraying should take place shortly after the over-wintering eggs have hatched and should be directed against the undersides of the leaves.

EXPLANATION OF PLATE IX.

Stephanitis pyrioides Scott.

Figure 1, egg
Figure 2, 1st stage nymph
Figure 3, 2nd stage nymph
Figure 4, 3rd stage nymph
Figure 5, 4th stage nymph
Figure 6, 5th stage nymph
Figure 7, Adult
Figure 8, Anal claspers of male
Figure 9, Ovaries
Figure 10, Ovipositor.

The Occurrence of the Genus Monobaeus Foerster in North America (Hym.).

By A. A. GIRAULT, Glenn Dale, Maryland.

The following species is the first of this genus to be described from North America. The genus, as represented by the new species, has the parapsidal furrows distinct, as is also sometimes (or often) true for *Ormyrus*. The two genera differ in the number of ring-joints only. The species differ much in the sculpture of the abdomen, especially as regards the arrangement of the coarser punctures at the base of the segments. The club is sub-solid, but its articulations are still visible.

Monobaeus hegeli new species.

Female:—Length, 3.00 mm. Abdomen distinctly longer than the rest of the body, substylate at apex.

Very similar to *Ormyrus ventricosus* Ashmead but more robust and the abdomen, besides the usual median carina dorsad and the scalloped cross-ridges, bears a single row of coarse punctures at base of segments 4 and 5 and is densely pin-punctate instead of scaly, while segment 6 is densly thimble-punctate. Also the propodeum is bicarinate at the meson instead of tricarinate as in *ventricosus*. Funicle 1 hemispherical, shortest, over thrice the size of the usual ring-joint; other funicle joints a little wider than long. Body downy. Types compared.

Described from one female from Michigan (C. P. Gillette). *Type*: Catalogue *No.* 20239, U. S. N. M., the specimen on a tag, an antenna on a slide.

Perhaps this genus may grade into *Ormyrus;* that is, the second ring-joint be larger and larger in relation to the first, so that it is no longer possible to distinguish one from two ring-joints in some cases. Then the two genera must be merged as Mayr has done.

A Correction in Spelling (Col.)

Mr. Edw. M. Ehrhorn, Superintendent, Division of Entomology, Territory of Hawaii, has recently called my attention to the wrong spelling of *Acythopeus* in my paper on "Some Unusual Orchid Insects," in the "News" for January, 1917, where it appears as *Acypotheus*. I was misled in this by following the spelling in Mr. Champion's paper in the "Entomologist's Monthly Magazine" for September, 1916, where it also appears as *Acypotheus,* evidently due to a printer's mistake.—HARRY B. WEISS.

Some Critical Notes on the Giant Katydids Forming the Group Steirodontia (Orthoptera, Tettigoniidae, Phaneropterinae).

By JAMES A. G. REHN, Academy of Natural Sciences, Philadelphia, Pa.

(Plate X.)

The notes gathered together in this paper have accumulated while studying the material of this group contained in certain large South and Central American and West Indian series of Orthoptera, now in our hands for determination. The remarks are grouped under the genera considered, but, aside from the revision of the forms of the *Stilpnochlora marginella* group, they are not presented as exhaustive or final, instead being intended merely as suggestions, to help the future student who has before him more material of this group of most interesting and striking species.

STILPNOCHLORA Stål.

1873. *Stilpnochlora* Stål, Öfvers. K. Vetensk.-Akad. Förhandl., 1873, No. 4, p. 40.

1906. *Microcentrum* Kirby (not of Scudder, 1862, as restricted), Synon. Catal. Orth., II, p. 455.

Genotype: *Phylloptera marginella* Serville (by original designation).

Kirby is quite in error in considering *Microcentrum* the proper name for this genus. It is in part *Microcentrum* of Scudder, but the genotype of the latter genus was properly selected by us as *affiliatum* Scudder (=*rhombifolium* Saussure).[1] As shown at the time of our selection of the genotype, Kirby selected as genotype of Scudder's genus a species not included in the genus by Scudder, so his fixation is erroneous. The action taken by us retains the names in their time-honored positions and is in accord with Article 30 of the Revised International Code of Zoological Nomenclature.

The known species of the genus *Stilpnochlora* are all before us at present, with the exception of Saussure and Zehntner's *ovalifolia*, which was described from Brazil,[2] and concerning

[1] Proc. Acad. Nat. Sci. Phila., 1908, p. 398 (1908).
[2] Biol. Cent.-Amer., Orth., I., p. 369 (1898).

which we can say nothing. The other forms fall quite naturally into four divisions, which in a linear fashion we would arrange as follows: *S. thoracica* Serville (= *tolteca* Saussure and authors); the *marginella* group, comprising *marginella* (Serville), *couloniana* (Saussure), *quadrata* (Scudder) and *laurifolium* (Linnaeus); *S. azteca* (Saussure); and last, *S. incisa* Brunner.

We would consider *S. thoracica* more divergent from the Steirodontid genera following *Stilpnochlora* than the other groups of the genus, and *S. incisa* nearer them, with *azteca* relatively close to it, both having a short inflated type of pronotum and a tendency of the lateral margins of the pronotal disk to be elevated. The *marginella* group clearly holds an intermediate position. At this writing we have no important information to give on any of the sections of the genus except the *marginella* group, which is a very plastic assemblage of four species, the relationships of which were not comprehended previously.

Stilpnochlora marginella Group.

This group, the greater portion of which was formerly considered to represent a single widely distributed species, for which the name *marginella* was used, is composed of four species, two of which—*marginella* and *laurifolium*—are quite distinct from each other and from the other forms—*quadrata* and *couloniana*—which are much more closely related.

Serville's *marginella*[3] was described from the Cape of Good Hope, of course in error, as all the members of the genus are American. There is nothing sufficiently diagnostic in its description to enable us to definitely place the name, but it is very probable he had Brazilian material, as much of his South American material came from that region, and Stål, the first author to comment on Serville's species, associated Brazilian material with it. In consequence of this we feel warranted in restricting Serville's name to the form of eastern Brazil and the Guianas, at least until an examination of the Serville material, if still extant, can be made. Saussure, in 1861, described the Cuban form of this group as *Phylloptera couloni-*

[3] Hist. Nat. Ins., Orth., p. 405 (1839).

ana,[4] while, in 1869, Scudder described *Steirodon quadratum*[5] from Guayaquil, Ecuador, which appears to us to be the form of this species group found in Mexico, Central America and northwestern South America.

Linnaeus, in 1758, gave the name *Gryllus* (*Tettigonia*) *laurifolius*[6] to the insect figured by Sloane in his Natural History of Jamaica,[7] which is the most distinct member of this species group.

The distribution of these forms is most interesting and to a measure suggestive of the relationship of certain faunas. The eastern Brazilian species, *marginella* (Serville), ranges from at least as far south as the State of São Paulo, north to Trinidad and Surinam. The Central American form, *quadrata* (Scudder), covers an area extending from central Mexico south to western Ecuador and probably Peru (Saussure as *marginella*), while along the north coast of South America it apparently extends eastward, as it occurs in Trinidad with *marginella*. The Cuban *couloniana* is known only from that island and Florida, while *laurifolium* is limited to Jamaica. The close affinity of the Mexican and Cuban forms is additional evidence of the Mexican influence in the Greater Antilles.

The chief feature which distinguishes the species is the form of the stridulating field of the tegmina of the male. This is least extensive, with its free margin almost regularly arcuate and hardly angulate, and having a short stridulating vein, in *marginella*; in *couloniana* the field is broader, with a rounded obtuse angulation at the extremity of the vein, which is somewhat heavier and longer; in *quadrata* the breadth of the field is distinctly greater, the margin is more decidedly obtuse-angulate and but little rounded, while the stridulating vein is more elongate; finally, in *laurifolium* the field is very broad, the margin is more decidedly angulate and the stridulating vein quite long and greatly thickened and elevated.

The pronotum of the male shows a corresponding increase

[4] Révue et Magasin de Zoologie, 2e ser., XIII, p. 128 (1861).
[5] Proc. Boston Soc. Nat. Hist., XII, p. 331 (1869).
[6] Syst. Nat., X ed., p. 429 (1758).
[7] II, p. 201, pl. 236, figs. 1 and 2 (1725).

in width as the stridulating field widens, while in the female this difference in the form of the pronotum is apparently the only feature which will readily separate the forms. Females of *couloniana* and *quadrata* are very similar, so much so that they are sometimes extremely hard to separate. We have given figures of the principal differences separating the species, as they are so comparative that their use in a key would be difficult and at most unsatisfactory. We find no other features of sufficient importance to use as diagnostic features.

Stilpnochlora marginella (Serville). Plate X, fig. 1.

1839. *Phylloptera marginella* Serville, Hist. Nat. Ins., Orth., p. 405. ["Cape of Good Hope."]

1869. *Phylloptera magnifolia* Walker, Catal. Derm. Salt. Brit. Mus., II, p. 377. (Part.) [Brazil; Guayaquil.]

Trinidad. (F. W. Urich.) One male. [A. N. S. P.]

Surinam. V, 1881. (C. G. Hering.) One female. [U. S. N. M.]

Cayenne. One male. [A. N. S. P.]

Peixe Boi, east of Pará, Pará, Brazil. XI to XII, 1907. (H. B. Merrill.) Two females. [A. N. S. P.]

Igarapé-assú, Pará, Brazil. (H. S. Parish.) One male. [A. N. S. P.]

Bonito, Pernambuco, Brazil. XI, 1883. (A. Koebele.) One male. [U. S. N. M.]

Piracicaba, São Paulo, Brazil. One male, one female. [Hebard Cln.]

The species has been previously recorded from as far south as Rio de Janeiro, Brazil. This form is smaller than the average of the other types of this group. It has the narrowest pronotum and stridulating field of the male tegmina and the general form is faintly more compressed than in the other species. The specimens from Piracicaba have the lateral lobes of the pronotum faintly narrower in proportion to their depth. The male stridulating field is identical in its important features with the north Brazilian males. We consider these specimens to represent the extreme condition of *marginella*.

Stilpnochlora couloniana (Saussure). Plate X, figs. 2 and 7.

1861. *Phylloptera couloniana* Saussure, Révue et Magasin de Zoologie, 2e ser., XIII, p. 128. [Cuba.]

1862. *M[icrocentrum] thoracicum* Scudder (not *Steirodon thoracicus* Serville, 1831), Boston Journ. Nat. Hist., VII, p. 447. [Tortugas, Florida.]

Cuba. One male, two females. [Hebard Cln.]

Cabañas, Pinar del Rio, Cuba, IX, 5 to 8, 1913. One male. [A. M. N. H.]

Santiago, Oriente, Cuba, X to XII, 1913. One male, one female. [A. N. S. P.][8]

Guantanamo, Oriente, Cuba. VIII, 7, 1913. (C. T. Ramsden, at light.) One female. [A. N. S. P.]

This species is only known from Cuba, the Isle of Pines and the peninsula of Florida. In Cuba it seems to occur over the whole island and in Florida it occurs as far north as Gainesville. Elsewhere a considerable number of Floridan references have been given, which it is unnecessary to discuss in this summary. The affinity of *couloniana* with *quadrata* is marked and its origin is to our mind clearly evident. Its distribution and affinity is comparable to the distribution of *Mantoida maya* and *Phrixa maya*.

The tegmina of Cuban specimens of this species are broader proportionately than in *quadrata,* and in the female sex this is the one evident feature to separate the two forms. In Florida material, however, the tegmina are somewhat narrower and the females are almost indistinguishable from Mexican individuals. The Florida males, however, are fully typical of *couloniana*.

Stilpnochlora quadrata Scudder. Plate X, figs. 3 and 6.

1869. *Steirodon quadratum* Scudder, Proc. Boston Soc. Nat. Hist., XII, p. 331. (April, 1869.) [Guayaquil, Ecuador.]

1869. *Phylloptera magnifolia* Walker, Catal. Derm. Salt. Brit. Mus., II, p. 377. (Part.) (Not earlier than October, 1869.) [Brazil; Guayaquil.]

Monte Redondo, Costa Rica. III, 30, 1895. (C. F. Underwood.) One male. [Hebard Cln.]

[8] Previously recorded by us (Sec. Rep. Cent. Exper. Sta. Cuba, p. 210, 1909) as *S. marginella.*

Cartago, Costa Rica. IX, 19, 1909. (P. P. Calvert; well sustained flight around electric light in plaza.) One male. [A. N. S. P.]

Cauca, Colombia. (Fortunato Bonis.) Two females. [A. N. S. P.]

Medellin, Colombia. IX, 1912. (Fr. A. Maria.) One male. [Hebard Cln.]

Jimenez, Colombia, elev. 1600 feet. VII, 1907. (M. G. Palmer.) One male. [A. N. S. P.]

Caparo, Trinidad. VI, 1913. (S. M. Klages.) One male, [A. N. S. P.]

All previous records of *marginella* made by us on the basis of Mexican and Costa Rican material relate to this species. From our present knowledge *quadrata* has the widest distribution of any form of the genus. It occurs from north-central Mexico (Tepic) and northern Yucatan south to at least Ecuador and probably Peru, east to Trinidad, where its range touches or overlaps that of *S. marginella*. At its northern limit the range extends to the limit of mainland connections (Yucatan) in the direction of its very near ally, the Cuban *couloniana*.

There is much size variation in the species, some in the general form of the pronotum, and to a lesser degree in the pronotal outline, but the male sex is not difficult to separate from *couloniana*. The females, on the other hand, are much more troublesome, as Floridan female individuals of *couloniana* are almost indistinguishable from that sex of *quadrata*. On close comparison it will be seen that the females of *quadrata* have slightly more elongate tegmina, with the sutural margin showing a less distinct angle at the distal fourth and the marginal field more regularly attenuate. Cuban *couloniana* females, which show an appreciably wider tegmen, are more readily differentiated.

Stilpnochlora laurifolium (Linnaeus). Plate X, fig. 4.

1758. [*Gryllus* (*Tettigonia*)] *laurifolius* Linnaeus, Syst. Nat., X ed., p. 429. ["Indiis."]

1878. *St*[*ilpnochlora*] *coulonia* Brunner (not *Phylloptera couloniana* Saussure), Monogr. der Phaneropt., p. 359. [Jamaica.]

Cinchona, Jamaica. II, 26, 1911. (J. A. Grossbeck.) One male. [Amer. Mus. Nat. Hist.]

Montego Bay, Jamaica. III, 1911. (J. A. Grossbeck.) One male. [Amer. Mus. Nat. Hist.]

Montego Bay, Jamaica. XII, 1913, and III, 1914. (C. G. Hussey.) Three males. [Hebard Cln.]

This is the most striking member of the genus, and it is found in a relatively restricted and most isolated habitat for a *Stilpnochlora*. Quite curiously it has not been previously recognized from material since Sloane's drawing (the basis of *laurifolius* Linnaeus), aside from Brunner's comments on a male from Jamaica which showed differences from *marginella*. Sloane's original figure was based on a specimen which "came amongst some Scotch Grass, brought from the Caymanes for the Horses, and was taken in the Stable and kept alive on Sugar and Water for some Time."[9] It is very probable the specimen was a native Jamaican insect, which found a congenial resting place on the Cayman grass. Linnaeus' name was erroneously used for a great many years for a North American species of *Microcentrum*, a misuse apparently due to the failure of authors to verify the source of the name. The figure of Sloane is clearly a *Stilpnochlora*, and as far as can be determined represents the present species.

The species has a development of the stridulating field of the male, which is very great; in fact, it is the most striking thing about that sex of the insect. We have not examined the female and can make no comment on that sex, as it is apparently unknown at this writing.

The measurements (in millimeters) of two representative males of this species are as follows:

	Montego Bay Jamaica XII, 1913	Montego Bay Jamaica III, 1914
Length of body	31	33
Length of pronotum	9.5	9.5
Greatest caudal width of pronotal disk	8.3	8.4
Length of tegmen	60	59.5
Greatest width of tegmen	20.2	19.6
Greatest width of stridulating field of tegmen	9.4	9.5
Length of caudal femur	32.3	32.5

[9] Nat. Hist. Jamaica, II, p. 201, pl. 236, figs. 1 and 2 (1725).

STEIRODON Serville.

Kirby's treatment of the specific names under this genus is incorrect, as he completely ignores Stål's examination[10] of the Linnean material of *Gryllus* (*Tettigonia*) *citrifolius*.

The original material, according to Stål, belongs to the genus *Posidippus*. As this material was examined by a competent student its importance completely overshadows the Roesel figure[11] referred to by Linnaeus, which quite clearly depicts a member of the genus *Peucestes*.

Kirby, however, apparently without any justification, considers Linneaus' species to be a *Steirodon*. The above explanation will show the error of his association.

As we have already shown,[12] the genus *Steirodon* must have as its type, there designated some months before Kirby's indication, *Phylloptera citrifolia* Thunberg (not *Gryllus* (*Tettigonia*) *citrifolius* Linnaeus), the original material of which is a *Steirodon* according to Stål, who renamed it *Steirodon validum*. The *Locusta citrifolia* of DeGeer[13] is clearly a *Posidippus*, while Stoll's *Locusta citrifolia*[14] is with equal certainty a *Peucestes*.

The genera *Steirodon* and *Peucestes* are extremely close, in fact females of *Peucestes dentatus* are quite liable to be mistaken for species of *Steirodon*, as the distal ramus of the median vein of the tegmina in the four females seen reaches the apex of the tegmina, a feature supposed to be characteristic of *Steirodon*. Males of the same species, however, do not show this peculiarity, the ramus reaching the sutural margin. More material may show the necessity of uniting *Peucestes*, in whole or at least in part, with the older *Steirodon*.

PEUCESTES Stål.

For remarks on the close relationship of *Peucestes* and *Steirodon* see above under the latter genus.

Peucestes striolatus Brunner.

1878. *P*[*eucestes*] *striolatus* Brunner, Monogr. der Phaneropt., p. 366. [Pernambuco and Bahia, Brazil; Panama; Peru.]

[10] Recens. Orthopt., II, p. 45 (1874).
[11] Insect. Belust., II, p. 107, pl. XVI, fig. 1.
[12] Proc. Acad. Nat. Sci., Phila., 1905, p. 807 (1906).
[13] Mém. Ins., III, p. 437, pl. 37, fig. 3 (1773).
[14] Natuur. Afbeeld. Beschr. etc., Zabelspr., p. 11, pl. IVa, fig. 12 (1813).

Chanchamayo, Peru. Three males, four females. [A. N. S. P.]

The Chanchamayo series clearly belongs to this species, but may represent a new geographic race characterized by the greater compression of the pronotum.

Peucestes dentatus Stål.

1874. *P[eucestes] dentatus* Stål, Recensio Orthopt., II, p. 45. [Panama; Cayenne.]

Orotina, Costa Rica. X, 11, 1915. (A. Alfaro; night.) One female. [A. N. S. P.]

Costa Rica. Two females. [A. N. S. P. and Hebard Cln.]

Panamá. One male. [U. S. N. M.] One female. [Hebard Cln.]

Cauca, Colombia. One male. [A. N. S. P.]

The species *dentatus* appears to us to be quite distinct from *coronatus*. Saussure and Zehntner seem to have had the best conception of the species of this genus and their relationship.

The genus *Steirodon* is dangerously close to this species, as we have already remarked above. Females of this species, as we understand it, have the distal rami of the median vein of the tegmina reaching to apex.

The Panamá male is slightly different from the Cauca individual, but the differences are not specific.

Peucestes championi Saussure and Zehntner.

1898. *Peucestes championi* Saussure and Zehntner, Biol. Cent.-Amer., Orth., I, p. 371, pl. XVIII, figs. 6 to 9. [Panzos, Vera Paz, Guatemala; Cachi (Caché), Costa Rica.]

Cachi, Costa Rica, 3500 feet elevation. (C. H. Lankester.) One male. [A. N. S. P.]

This specimen is perfectly typical of the species. We do not feel sure that Saussure and Zehntner's sex association is correct, as the female, from the figure, seems quite different. We have, however, no evidence on this except that furnished by the figures.

Generic divisions united by Brunner under Posidippus.

A. Cephalic margin of pronotal disk with median tooth. Tegmina proportionately broad; marginal field equal to one-half tegminal width at proximal third. Median and caudal tibiae not distinctly

expanded proximad. (Fastigii of the vertex and face subequal in width. Pronotal lateral margins regularly crenato-dentate. Cephalic tibiae with foramina narrowly open on cephalic face, broadly open on caudal face) ..... **Posidippus** Stål.

(Genotype: *Gryllus* (*Tettigonia*) *citrifolius* Linnaeus.)

AA. Cephalic margin of pronotal disk without median tooth. Tegmina proportionately narrow, more lanceolate; marginal field not equal to one-half tegminal width at proximal third. Median and caudal tibiae distinctly expanded or even lamellate proximad (except in *Frontinus degeerii* and *rarospinulosus*).

B. Fastigium of the vertex produced cephalad of the facial fastigium, rounded at the extremity; facial fastigium acuminate, narrower than the fastigium of the vertex. Pronotum with lateral margins of disk elevated, crassly dentate. Stridulating field of male tegmina with free margin sinuate. Cephalic tibiae with foramina rimato-conchate on both faces. Median and caudal tibiae compressed, decidedly lamellate in proximal half. **Cnemidophyllum** new genus.

(Genotype: *Posidippus lineatus* Brunner.)

BB. Fastigii equally produced or the fastigium of the face projecting cephalad of that of the vertex, in width either subequal or the facial fastigium twice as wide as that of the vertex, both bituberculate. Pronotum with lateral margins not distinctly elevated, finely crenulate. Stridulating field of male tegmina with free margin arcuate. Cephalic tibiae with foramina rimato-conchate on cephalic face and open on caudal face. Median and caudal tibiae compressed, not decidedly lamellate.

C. Fastigii equally produced, in width subequal. **Frontinus** Stål.

(Genotype: *F. degeerii* Stål.)

CC. Fastigium of the face projecting cephalad of that of the vertex, the facial fastigium twice as wide as that of the vertex, both bituberculate..... **Steirodonopis** Scudder.

(Genotype: *S. bilobata* Scudder.)

POSIDIPPUS Stål.

1874. *Posidippus* Stål, Recens. Orthopt., II, pp. 20, 45.

Genotype: *Gryllus* (*Tettigonia*) *citrifolius* Linnaeus.

The restricted genus *Posidippus* certainly includes, in addition to the genotype, *P. validus* Saussure and Zehntner, while of the exact generic position of *stâli, dohrni* and *irregulariter-dentatus* Brunner and *barellus* Pictet we cannot speak at present, having examined no material of these forms, all of which have been placed in *Posidippus* as generally understood.

Posidippus citrifolius (Linnaeus).

1758. [*Gryllus* (*Tettigonia*)] *citrifolius* Linnaeus, Syst. Nat., ed. X, p. 429. ["Indiis."]

1869. *Steirodon dentiferum* Walker, Catal. Dermapt. Brit. Mus., II, p. 391. [Unknown locality.]

Bogotá, Colombia. Two females. [U. S. N. M.]

Chanchomayo, Peru. One male, one female. [A. N. S. P.]

Contamano, Rio Ucayali, Peru. X to XII, 1912. Two males. [A. N. S. P.]

Porto Velho, Rio Madeira, Brazil. (Mann and Baker; M. Bolton.) Two males. [A. N. S. P.]

Rio Una, forty-six miles south of Bahia, Brazil. (A. de Lacerda.) One male. [M. C. Z.]

Piracicaba, São Paulo, Brazil. Three females. [Hebard Cln.]

This specific name has been variously considered to belong to members of three genera, i. e. *Steirodon, Peucestes* and *Posidippus,* but all question of the proper association of it should be set at rest by Stål's examination of the Linnean material. Regardless of the Roesel figure, quoted by Linnaeus, which clearly represents a species of *Peucestes,* the testimony of Linnaeus' material, which belongs to *Posidippus,* as here understood, is the measure of proof. The synonymy of *dentiferum* is given on the authority of Kirby, who examined the Walkerian material and so associated it.

The material now before us shows the species has some variation in the exact form of the free margin of the stridulating field of the tegmina of the male and, as usual in the group, in the exact number of the lateral marginal dentations on the pronotum. There is also an appreciable, though slight, amount of variation in the compression of the lateral pronotal carinae. This latter feature is correlated with the degree of concavity of the cephalic margin of the disk of the same. These variations appear to be almost entirely individual.

The species is now known to range from the region of Bogotá to Surinam and eastern Brazil, south to eastern and central Peru.

Posidippus validus Saussure and Zehntner.

1898. *Posidippus validus* Saussure and Zehntner, Biol. Cent.-Amer., Orth., I, p. 373, pl. XVIII, figs. 10 and 11. [Chontales, Nicaragua.]

Panamá. (Drs. G. W. and W. Nelson.) One male. [U. S. N. M.]

Hacienda Cincinnati, Santa Marta, Colombia, 4000 to 5000 feet elevation. VII, 1913. (M. A. Carriker, Jr.) One female. [Hebard Cln.]

These specimens are perfectly typical of *validus,* which is readily separated by the characters given by Saussure and Zehntner. The features of the stridulating field of the tegmina of the male we are unable to compare with *citrifolius,* as the single available individual of that sex of *validus* has that area broken. The present female is slightly under the original measurements.

The species is seen to range from Nicaragua to northern Colombia.

CNEMIDOPHYLLUM[15] new genus.

1891. *Posidippus* Brunner, Verh. K.-k. Zool.-botan. Gesell. Wien XLI, pp. 183, 184. (Part.)

Genotype: *Posidippus lineatus* Brunner.

Form compressed. Eyes ovato-globose in basal outline; fastigium of vertex narrow, compressed, produced, moderately declivent, sulcate, rounded at apex; fastigium of face covered by fastigium of vertex, very narrow. Pronotum with disk concave; cephalic margin non-dentate; lateral margins moderately elevated crasso-dentate; disk expanding in width caudad. Tegmina lanceolate; sutural margin straight for the greater portion of its length; marginal field equal to two-fifths of the total tegminal width; stridulating field of male broad, free margin sinuate, stridulating vein robust, elongate. Cephalic femora with four spines on ventro-cephalic margin; cephalic tibiae inflated proximad, foramina rimato-conchate on both faces; median tibiae greatly compressed and lamellate expanded on proximal half, margins of expansion spined. Caudal femora simple, ventral margins spined; caudal tibiae greatly

[15] From κνημὶς *greaves* and θυλλον *leaf.*

compressed and lamellate expanded on proximal one-half, margins of expansion spined. Mesosternal lobes acute-angulate. Metasternal lobes broadly rounded acute-angulate.

This genus includes, as far as we know, only the genotypic species. Its form is very striking and it is clearly defined from *Posidippus,* as well as from the aberrant genera *Frontinus* and *Steirodonopis.*

Cnemidophyllum lineatum (Brunner). Plate X, figs. 5, 8 and 9.
1891. *Posidippus lineatus* Brunner, Verhandl. K.-k. Zool.-botan. Gesell. Wien, XLI, pp. 183, 184. [Upper Amazons.]

Contamano, Rio Ucayali, Peru. X to XII, 1912. One male. [A. N. S. P.]

This remarkable species has been sufficiently described by Brunner, than whose type our individual is slightly smaller. As the present specimen has been dried from alcohol it has lost all its original coloration, excepting the dark markings, which are distinctly indicated and disposed as described by Brunner. The minute striolations of the tegmina are also very faintly indicated.

The species is known only from the two records.

FRONTINUS Stål.
1874. *Frontinus* Stål, Recens. Orthopt., II, pp. 20, 46.
Genotype: *Frontinus degeerii* Stål.

We feel that no useful purpose is served in longer retaining within the genus *Posidippus,* the well defined species which constitute this and the following groups. In detailed characters they are as clearly defined as any of the allied genera, while their general appearance is so distinct they are easily recognized. The policy of Brunner was to consider them members of *Posidippus.*

From the related *Steirodonopis,* Stål's genus can be readily separated by the fastigii being sub-equal in width and length, while (in *degeerii* at least) the stridulating field of the male tegmina is broad and extensive, with the stridulating vein heavy, arcuate and sub-transverse. This genus includes *rarospinulosus* Brunner in addition to the genotypic species.

Frontinus degeerii Stål. Plate X, fig. 11.
1874. *Frontinus degeerii* Stål, Recens. Orthopt., II, p. 46. [Surinam.]

Costa Rica. (C. F. Underwood.) One male. [Hebard Cln.]

This specimen fits the description of *degeerii* more closely than it does that of the allied *rarospinulosus,* but the acquisition of Guianan material may show it to be different. Unfortunately at this writing no topotypic material is available.

This is the first Central American record of a species of this genus.

STEIRODONOPIS Scudder.

1875. *Steirodonopis* Scudder, Proc. Boston Soc. Nat. Hist., XVII, p. 259.

Genotype: *Steirodonopis bilobata* Scudder.

An examination of the unique type of Scudder's species enables us to associate his genus, which was ignored by some European students of this group. Quite evidently his work was done well within the year 1874, as the paper containing it was presented for publication December 16th, of that year. However, the date of actual publication of Scudder's genus is March, 1875.

From *Frontinus* the present genus can be very easily distinguished by the frontal fastigium being twice as wide as the fastigium of the vertex, the former projecting cephalad of the latter, while the stridulating field of the male tegmina is narrow, with the stridulating vein weak, nearly straight and oblique. In addition to *bilobata,* the genus contains *brunneri* Bolivar, which, however, may be identical with Scudder's species.

Steirodonopis bilobata (Scudder). Plate X, fig. 10.

1875. *Steirodonopis bilobata* Scudder, Proc. Boston Soc. Nat. Hist., XVII, p. 260. [Peruvian Marañon.]

1878. *P*[*osidippus*] *fastigiosus* Brunner, Monogr. der Phaneropt, p. 370. [Quito, Ecuador.][11]

1915. *Steirodonopsis* (*sic*) *scudderi* Bruner, Ann. Carneg. Mus., IX, p. 317. [Province of Sara, Bolivia.]

[11] Doubtless Quito was the point from which the specimen was received, although there is no doubt in our minds but that, along with birds and other natural objects, it was brought to Quito from the eastern part (Oriente) of Ecuador, or an adjacent portion of Peru or Colombia. Bogotá, Colombia, served for many years as such a distributing point for bird skins, as is well known to students of South American birds. Our opinion as to the true original locality of the typical material is re-enforced by Brunner's latest reference to material of the species from the upper Amazons.

Bartica, British Guiana. II, 12, 1913. (H. S. Parish.) One male. [A. N. S. P.]

Peruvian Marañon. One male, *type*. [M. C. Z.]

Chanchomayo, Peru, 1000 meters elevation (two specimens.) Two with no date; others II and V, 1910. Three males, two females. [A. N. S. P.]

As we have said above, the type of Scudder's species is before us, a unique male, and there is no doubt in our minds as to the synonymy of Brunner's *fastigiosus*. Brunner's *Steirodonopsis* (sic) *scudderi*, from the Province of Sara, Bolivia, appears to us to be only a small specimen of *bilobata*; in fact, the Bartica male here recorded is but faintly larger than his measurements. The material before us would fully fit his description. Regarding Bolivar's *Posidippus brunneri*[17] we cannot speak with such certainty, as the description is not as conclusive. It is certainly very close, if not identical, with the present species.

The number of spines on the dorsal margins of the median tibiae vary considerably in this species, often greatly on the two limbs of the same individual. Our specimens show the following count:

	Dorso-cephalic margin	Dorso-caudal margin
♂ Bartica, British Guiana	3 / 3	4 / 5
♂ Peruvian Marañon, *type*	3 / other tibia missing	4
♂ Chanchomayo, Peru	2 / 2	4 / 6
♂ Chanchomayo, Peru	3 / 5	3 / 6
♀ Chanchomayo, Peru	3 / 1	5 / 6

The range of the species is almost covered by the records given above. The previous records were all from the upper Amazonian region, except the certainly erroneous Quito one, upon which we have already commented, and Bruner's records of the synonymic *scudderi* and *fastigiosus* from the Province of Sara, Bolivia.

[17] An. Soc. Españ. Hist. Nat., X, p. 484 (1881). [Napo, Ecuador.]

EXPLANATION OF PLATE X.

Stridulating field of the sinistral tegmen of male (x 2).

Fig. 1—*Stilpnochlora marginella* (Serville). Cayenne.

Fig. 2—*Stilpnochlora couloniana* (Saussure). Santiago, Cuba.

Fig. 3—*Stilpnochlora quadrata* (Scudder). Jimenez, western Colombia.

Fig. 4—*Stilpnochlora laurifolium* (Linnaeus). Cinchona, Jamaica.

Fig. 5—*Cnemidophyllum lineatum* (Brunner). Contamano, Rio Ucayali, Peru.

Lateral outline of tegmen of male (x 1½).

Fig. 6—*Stilpnochlora quadrata* (Scudder). Cauca, Colombia.

Fig. 7—*Stilpnochlora couloniana* (Saussure). Santiago, Cuba.

Fig. 8—*Cnemidophyllum lineatum* (Brunner). Lateral view of male. Contamano, Ucayali, Peru (x 1¼).

Fig. 9—*Cnemidophyllum lineatum* (Brunner). Lateral view of fastigium of male. (Greatly enlarged.) a—base of antennae.

Fig. 10—*Steirodonopis bilobata* Scudder. Dorsal outline of fastigii. Male. (Greatly enlarged.)

Fig. 11—*Frontinus degeerii* Stål. Dorsal outline of fastigii. Male. (Greatly enlarged.)

An Aid in the Entomology of New Jersey.

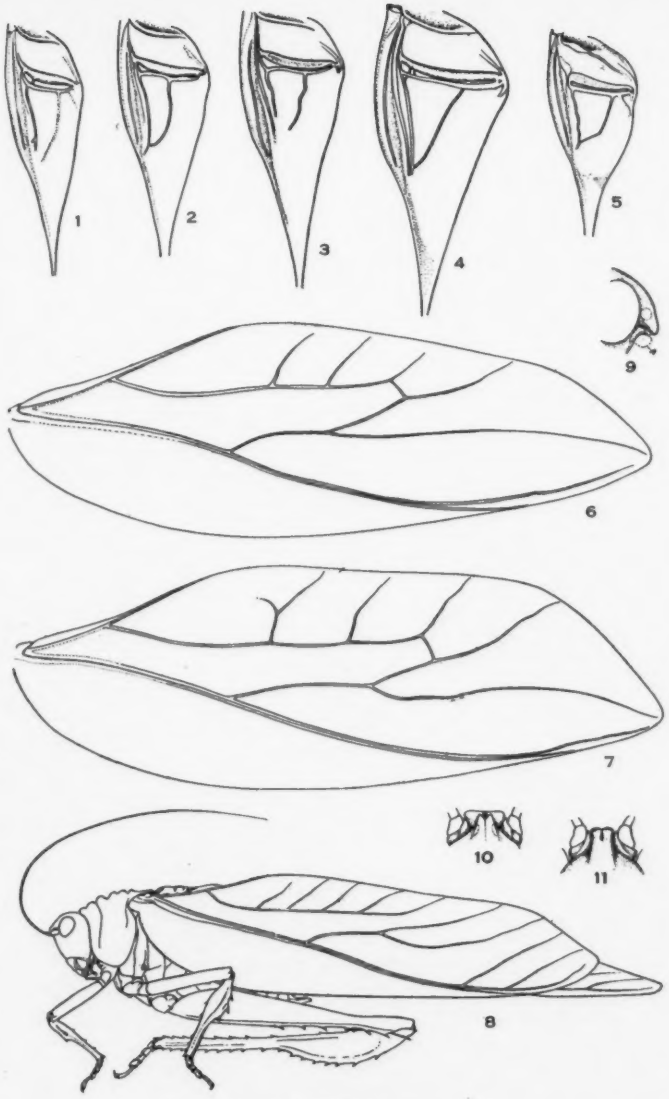
Dr. John W. Harshberger, Professor of Botany in the University of Pennsylvania, Philadelphia, has just published an attractive volume, "The Vegetation of the New Jersey Pine-Barrens An Ecologic Investigation" (Philadelphia, Christopher Sower Co., 1916. 8vo., pp. xi, 329. 284 figs., folding map). This is, of course, essentially a botanical work, which supplements Stone's "The Plants of Southern New Jersey," issued in 1911 by the New Jersey State Museum, "including only that which has not been mentioned by Stone, or in a very casual and unemphatic way." Although there are three pages of "Notes on a few insect galls of the pine barrens," Dr. Harshberger's book will be chiefly of interest to entomologists in the vegetative background which it furnishes for the study of the rich insect fauna of New Jersey.

Data on the Far Southwestern States Wanted (Lep.).

The Entomological Department of the Southwest Museum (Los Angeles, California) is engaged in the compilation of a check list of diurnal Lepidoptera occurring in the Southwest. The territory includes Colorado, New Mexico, Arizona and California. It is planned particularly to secure definite data as to the exact locality of occurrence and month of greatest abundance of all the rarer and more localized forms, namely those which are restricted in range.

With this list it is also planned, if possible, to include a directory of Entomologists residing in the four States named.

The Museum will appreciate data from all collectors having material from the territory in question. Communicate with DR. JOHN COMSTOCK, 1275 Bellevue Avenue, Los Angeles, or with the Entomological Department, Southwest Museum, Avenue 46 and Marmion Way, Los Angeles, California.



GIANT KATYDIDS—REHN.

1.—Stilpnochlora marginella.
2.— " couloniana.
3.— " quadrata.
4.— " laurifolium.
5.—Cnemidophyllum lineatum.
6.—Stilpnochlora quadrata.
7.— " couloniana.
8.—Cnemidophyllum lineatum.
9.—Cnemidophyllum lineatum.
10.—Steirodonopsis bilobata.
11.—Frontinus degeerii.

New North American species of Dolichopodidae (Dip.).

By M. C. VanDuzee, Buffalo, New York.

Key to the North American Species of Mesorhaga.

1 Femora wholly yellow; (females) 5
Femora more or less black..... 2
2 All tibiae and tarsi black or brown (fore pair somewhat yellowish in the females) ..... **nigripes** Ald.
Tibiæ yellow (males) 3
3 Hypopygium with small yellow appendages..... **albiciliata** Ald.
Hypopygial appendages fully one-third as long as the hypopygium 4
4 Fore and middle femora black or green but yellow at base and tip ..... **caudata** V. D.
Fore femora wholly yellow, middle femora black at base on the lower side ..... **varipes** sp. nov.
5 All coxæ black ..... **albiciliata** Ald.
Fore coxæ yellow 6
6 Bristles of the thorax mostly pale, hairs of abdomen pale..... **townsendii** Ald.
Bristles of the thorax and hairs on the base of the abdomen above black ..... **borealis** Ald.

Mesorhaga varipes sp. nov.

♂. Length 4 mm. Face and front green, the former broad with thick coarse white pollen which almost conceals the ground color in some lights; antennæ black, bristles of second joint yellowish; ocellar bristles black with a bunch of small pale hairs back of them; a few long yellowish bristly hairs on each side at the upper corners of the eyes; a few of the orbital cilia at the upper corner of the eye long and blackish, lower orbital cilia white.

Thorax blue-green; pleuræ with white pollen; bristles on the anterior portion of the dorsum blackish, those on the posterior part and the four on the margin of the scutellum yellowish.

Abdomen blue-green, its incisures very narrowly yellow; hairs on the dorsum of the abdomen short and yellow, those on the venter long and white; hypopygium and its appendages shining black, the latter long and fringed with short pale hairs.

Coxæ black or green with white pollen; fore pair with long white hairs on the front surface; tips of coxæ and the trochanters yellow; fore femora wholly yellow; middle femora with a black streak below from the base to about the middle; hind femora black with yellow tips; all femora with long white hairs below; tibiæ yellow, the tips of the hind pair a little brownish; tarsi infuscated from the tip of the first

joint; fore metatarsi three-fourths as long as their tibiæ and longer than the remaining four joints together; middle metatarsi about four-fifths as long as their tibiæ and one and one-fourth times as long as the remaining four joints.

Knob of the halteres yellow, stem brown; tegulæ white with black tips and long white cilia. Wings nearly hyaline; costa rather thick and black from the tip of the first vein; veins yellowish at the root of the wing.

Described from two males taken at Eastham, Massachusetts, June 27th, by C. W. Johnson. Type in the collection of the Boston Society of Natural History.

Mesorhaga nigripes Ald.

Two females and four males that seem to belong to this species are in the Cornell University material sent me for study. They come from Blue Lake, Humboldt County, California, and were taken by J. C. Bradley.

Prof. Aldrich described this species from females. I give the characters of the male below. The females differ from his description only in having all the tibiae and tarsi uniformly brown, and there is a small black bristle at the upper corner of the eye not mentioned by him.

♂. Hypopygium rather long, shining black, with a few long hairs on the outer or dorsal surface; appendages becoming more yellowish towards the apex, rather thick and tipped with two stout, black bristles. Femora ciliate below with long white hairs, these hairs as long as the thickness of the femora; in the female these hairs are much shorter, less than one-half the thickness of the femora. Third antennal joint rounded at tip, about as long as wide, second joint with a very long stout bristle below; in the female the antennae are formed about as in the male and of nearly the same size, but the bristles of the second joint are much smaller. The fore and middle metatarsi of both sexes are nearly as long as the four remaining joints.

Table of Males of the North American Species of Campsicnemus.

1	Middle tibiæ not or but little incrassated	2
	Middle tibiæ incrassated at least at base	4
2	Middle tibiæ yellow, not flattened	**degener** Wh.
	Middle tibiæ mostly or wholly black and somewhat flattened	3
3	Femora mostly yellow	**arcuatus** sp. nov.
	Femora mostly black	**nigripes** sp. nov.

4 Middle tibiæ thickened only near the base.....**hirtipes** Loew.
Middle tibiæ incrassated throughout..... 5
5 Middle tibiæ with a pedunculated knob near their apices.....
philoctetes Wh.
Middle tibiæ without a knob..... 6
6 Middle tibiæ entirely black ..... **oedipus** Wh.
Middle tibiæ in large part yellow..... 7
7 Middle metatarsi bent semicircularly..... **thersites** Wh.
Middle metatarsi not strongly curved..... **claudicans** Loew.

Campsicnemus arcuatus sp. nov. (Fig. 1).

♂. Length 2 mm., of wing 2.5 mm. Face narrow above, wider below, covered with dark yellowish brown pollen; front shining black; antennæ black, third joint larger than wide, rounded at tip.

Thorax shining black on the dorsum with purple reflections and an obscure green vitta visible on the posterior part. Scutellum bluish black with a reddish border; it has one pair of large bristles and between these are six hairs on the margin. Abdomen dull black; hypopygium concealed.

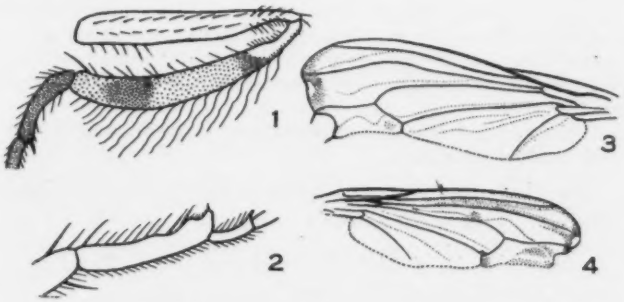


Fig. 1.—Tibia and metatarsus of middle leg of *Campsicnemus arcuatus* sp. nov.
Fig. 2.—First and second joints of middle tarsus of *C. nigripes* sp. nov.
Fig. 3.—Wing of *Liancalus hydrophilus* Ald.
Fig. 4.—Wing of *L. limbatus* sp. nov.

Fore coxæ yellow with silvery pollen and minute black hairs on the front surface; middle and hind coxæ black; all femora yellow, the fore pair a little blackened at base; middle pair narrowed near the apex; fore and hind tibiæ blackened at tip for one-third their length, also somewhat darkened at base, more yellowish in middle; middle tibiæ narrowed and briefly yellow at base, the remainder dull black, somewhat flattened, strongly and evenly arcuate, fringed with long delicate hairs above, these hairs curled at their tips; middle metatarsi curved upwards and with a stout sharp spur at tip (Fig. 1).

Tegulæ brownish with black cilia; knob of halteres yellow. Wings dark grayish with black veins.

Described from one male taken at Victor, Colorado, June 11th, at an elevation at 9800 feet. Type in the author's collection.

Campsicnemus nigripes sp. nov. (Fig. 2).

♂. Length 2 mm., of wing 2.5 mm. Face narrow with nearly parallel sides, covered with yellowish brown pollen which is darkened on the upper portion of the face; front black; antennæ black, third joint longer than wide, rounded at tip.

Thorax shining black with a trace of a green vitta on the posterior part; scutellum bluish black with a few delicate hairs on the margin (if there have been bristles on the margin, as no doubt there have been, they have been broken off). Abdomen black with green reflections.

Coxæ and legs altogether black, except the tips of the middle femora which are yellowish; the four hinder femora ciliated with short stout hairs below; middle tibiæ long, flattened, with a few rather long bristles above; middle metatarsi (Fig. 2) slightly arched with a large subquadrate ending which has a spur-like projection at one corner; the second joint is attached at the base of this quadrate ending; on the concave side the metatarsi are fringed with little bristles or hairs which are about as long as the thickness of the joint and two longer bristles near the base.

Tegulæ and their cilia brown; halteres dark yellowish brown. Wings dark grayish; veins black.

Described from one male taken at Sacramento, California, June 4th. Type in the author's collection.

Table of Males of the North American species of Liancalus.

1 First joint of fore tarsi shortened..... 2
Second joint of fore tarsi shortened..... 3
2 Last three joints of fore tarsi of nearly equal length.. **similis** Ald.
Third joint of fore tarsi as long as fourth and fifth together. **querulus** O. S.
3 The opaque white spot at the tip of the wing circular. **genualis** Loew.
The opaque white spot at apex of wing oval or semicircular..... 4
4 Wing deeply excised back of fourth vein and with two bristle-like pencils of hairs one either side of the excision (Fig. 3) .....**hydrophilus** Ald.
Wings deeply excised back of fourth vein but without the pencils of hairs, (Fig. 4) .....**limbatus** sp. nov.

Liancalus hydrophilus Ald. (Fig. 3).

I took a single male of this species at Colorado Springs. It was resting on rocks over which water was trickling, in South Cheyenne Canon. It measures but 7 mm. in length, which is about 2 mm. less than Prof. Aldrich's type specimens from the Black Hills, South Dakota, but the length of the wing is 7 mm., while the wings of his measured 7.5 mm. The knees of this specimen are distinctly but narrowly yellow. The other characters are as he gives them (Psyche, Vol. 6, p. 569). The drawing of the wing is from my specimen (Fig. 3).

Liancalus limbatus sp. nov. (Fig. 4).

♂. Length 9 mm., of wing 7.5 mm. Face bright green with silvery pollen which is quite thick along the orbits, divided a little below the middle by a transverse ridge; palpi thickly covered with silvery pollen and with small black hairs; proboscis dark brown; antennæ black, third joint only a little longer than wide, somewhat triangular; front dark greenish gray with a little white pollen; ocelli placed on a small brown spot; the black orbital cilia extending down to about the middle of the eye; below these are a few fine white cilia which are difficult to distinguish from the long yellowish hairs which cover the lower half of the occiput; the two post-vertical bristles are prominent but not very large.

Thorax bright metallic green with four golden-green vittæ, the outer ones broken at the suture; thorax quite thickly covered with white pollen which is almost invisible in certain lights; a single row of acrostichal bristles; six dorsocentrals on each side; bristles of the thorax inserted in minute black dots; metanotum green with white pollen; scutellum with six marginal bristles.

Abdomen green but so thickly covered with pollen as to appear whitish in certain lights; base of second and hind margin of second to fifth segments brown, which color extends forward along the center of the dorsum and reaches the base on the second and fourth segments; this brown color is due to pollen and the shining green ground color shows through it in certain lights; sixth segment green; abdomen with minute black hairs and more abundant and longer fine yellowish hairs, those on the sides and on the first segment longest; first segment with a few slender black bristles near the hind margin above; hypopygium mostly brown with two flattened filiments which are sparsely fringed with pale hairs and are two-thirds as long as the abdomen.

Fore coxæ green with white pollen and fine white hairs on the front surface and two small black bristles near the tip; middle and hind coxæ more blackish; legs green; knees slightly yellowish; tarsi black; fore tarsi with the first joint long, second joint only a little longer than wide, slightly dilated and fringed below with short bristles as in *genualis* and *hydrophilus*, third joint longer than fourth.

Tegulæ white with sharply defined yellow border and yellowish cilia; halteres yellow. Wings hyaline with brown clouds, one bordering the costa faint from the tip of the first vein to the tip of second vein more distinct from there to the apex of the wing, one along the second and third veins filling the cell between them except in outer part, one on last section of fifth vein; also a brown streak between third and fourth veins which has the appearance of a spurious vein; this streak is bent and has a cloud extending forward at about its first third; tip of wing dark brown with a somewhat semicircular opaque white spot at apex, this spot extending nearly from the tip of the third vein to the tip of the fourth vein; third vein ending in the apex of the wing; fourth vein a little angulated at the cross vein; there is a very small square cell at the inner angle of fifth vein and cross-vein; this cell is not quite complete in the right wing from which the drawing was made but is perfect in the left wing; cell between first vein and costa yellowish.

♀. Face and front with yellowish brown pollen; vittæ of thorax more coppery; a few stout black bristles near the hind margin of the third abdominal segment towards the sides; feet simple; wings simple with a large brown cloud on fourth vein before the cross-vein on last section of fifth vein and along the costa from tip of second vein to apex of wing.

Described from one male and one female taken at Berkeley, California, May 8th, on a wall of rock in a little canyon; the rock was covered with water-soaked moss. Type in the author's collection.

This species is very much like the European species *virens* Scop., but I think it is distinct. I have not seen *virens*, but Dr. Lundbeck has a drawing of the wing of that species, which does not show the deep emargination back of the fourth vein, nor does he mention it in his description, and he does not show any cloud on last section of fifth vein. The little cell at the inner angle of the fifth vein and the cross-vein in the male of *L. limbatus* do not appear in his figure. This cell may not be a constant character, but only accidental.

Photographs Received for the Album of the American Entomological Society.

During the year 1916 photographs for the Album were received and acknowledged from the following, and the members of the Society wish again to thank the donors for their gifts, which are much appreciated:

Mrs. Annie Trumbull Slosson, J. R. Malloch, F. Haimbach, M. S. Royal, of India, and Louis Laplace.

Notes on some Buprestidae of Northern California (Col.).

By W. J. CHAMBERLIN, Forest Entomologist, Oregon State College, Corvallis, Oregon.

This paper is the result of observations and collections made during two summers spent in northern California. The summer of 1915 was spent at Weed, a small lumbering town in Siskiyou County, at the base of Mt. Shasta. The general elevation surrounding Weed is 4500 feet. The summer of 1916 was spent in Siskiyou, Del Norte, Humboldt and Mendocino Counties of California.

Regarding the species taken at Weed it might be well to mention that there are from 50 to 60 cars of logs brought in daily from the Trinity Mountains, some thirty miles distant. It is probable that the majority of the forest insects are brought in with this timber, though undoubtedly some are attracted from the surrounding territory by the odor of fresh pine.

Buprestids were by far the most numerous beetles occurring in the vicinity of Weed and over 450 specimens were taken at odd times during a six weeks' stay.

1. **Chalcophora angulicollis** Lec.

Twenty-six specimens of this species were taken at Weed in 1915. The majority were captured resting in the bright sunshine, on buildings, telephone poles, on the wooden sidewalks and a few were taken while in flight. No less than ten specimens were taken on piled lumber. They attract attention by the rasping sound made in flight and are easily captured in the hand. They seem to be attracted by moving objects and will often alight on horses, moving wagons, or on man.

This species is common all over the northern half of the State, breeding in yellow pine, Douglas fir, white and grand fir.

2. **Dicerca prolongata** Lec.

This species has been taken by Dr. Van Dyke on *Populus trichocarpa* in Trinity County, California, and on *Populus tremuloides* at Lake Tahoe. It breeds in *P. trichocarpa* and doubtless in *P. tremuloides* also.

3. **Dicerca sexulis** Cr.

This is one of the handsomest species of the genus and is found throughout the northern part of the State. I have taken it from Douglas fir, which seems to be its principal host plant; also from yellow pine. Dr. Van Dyke has taken it from knobcone pine at McCloud, in June, 1914. I have taken specimens emerging from Douglas fir on April 4, at an elevation of 3500 feet in the Santiam National Forest of Oregon.

4. **Dicerca tenebrosa** Kirby.

Of this species Dr. Van Dyke writes as follows:

Have found the western phase of this species about Fallen Leaf Lake, Lake Tahoe, in July, 1915, on dead lodge pole pine, in which it no doubt breeds. It probably extends south through the Cascade-Sierra range in the lodge pole pine belt.

I have never encountered this species in California, but in the Blue Mountains of eastern Oregon it is the most common member of the genus and breeds in both *Pinus ponderosa* and *P. contorta*. Near Klamath Falls, Oregon, it was taken from *Abies concolor*.

5. **Dicerca hornii** Cr.

This species breeds in *Alnus* and *Ceanothus* in most counties of northern California. It is quite common locally at certain periods.

6. **Dicerca pecterosa** Lec.

This rare species was taken by Dr. Van Dyke at Lake Tahoe in July, 1915. In Oregon it breeds in peach, and I have taken it on the lodge pole pine in Grant County, Oregon.

7. **Trachykele opulenta** Fall.

I quote from Dr. Van Dyke on the two species of this genus:

A number of brilliantly green specimens of *Trachykele* were beaten from the alpine juniper on the ridge above Lake Tahoe, during July, 1915, by Ralph Hopping, E. P. Van Duzee and myself. Many borings in dead juniper limbs were also observed which were no doubt due to this species. This species, I have generally been considering as Fall's *opulenta*, though it may be true *blondeli* Mars. about which there has been so much uncertainty. It is quite similar to other specimens which I have from Seattle, Washington, where it no doubt lives on *Thuja plicata*, from Shasta County, California, in the territory of Sargent cypress in Marin County. In the southern Sierras, this species is also

found but another green one is also found there. This last is probably the true *opulenta* Fall.

The author has taken one specimen from the sapwood of *Lebocedras decurrens.*

8. **Trachykele nebulosa** Fall.

"One specimen taken at Carrville, Trinity County, California, in July, 1913. Others were taken about Lake Tahoe from *Abies concolor* by Hopping, Van Duzee and myself. It breeds in *Abies concolor* and *A. magnifica* as specimens have been taken emerging." Both species of this genus undoubtedly occur in favorable localities throughout the northern part of the State. They have been taken at Corvallis, Oregon, and also in Western Washington.

9. **Poecilonata cyanipes** var. **ferrea** Mels.

This species is found throughout the northern part of the State and probably breeds in all the poplars and willows. I have dug adults from *P. tremuloides* and *P. trichocarpa* in Humboldt County.

10. **Buprestis gibbsii** Lec.

Not common; found occasionally on oak and poplar in which they probably breed. One specimen taken at Garberville, Humboldt County, California, August, 1916. Found in Sonoma County, by Rivers; at Nevada City and Lake Ellann, Tuolumne County, by Van Dyke. May breed in *Quercus.*

11. **Buprestis connexa** Horn.

This rare and beautiful species is never found in numbers in any locality. Three specimens were captured. The first specimen was taken July 18 from the sapwood of yellow pine (*P. ponderosa*), fully mature and would doubtless have emerged in a few days. The gallery traversed the cambium for some distance, winding around in a very irregular pattern, then entered the sapwood to a depth of two inches. The pupal cell was just within the sapwood. The second specimen was taken on the 28th of July, resting on the foliage of yellow pine with numbers of *B. rusticorum.* The last specimen was found embedded in pitch on the end of a yellow pine log.

12. **Buprestis laeviventris** Lec.

This was the most numerous species encountered. Out of 116 specimens taken only 8 were taken on the freshly cut logs. They seem to have a preference for old dry logs and poles without bark. Many were taken on railroad ties and in the dust along the road. This is the only species I have ever encountered which deposits its eggs in or on logs where there is no bark. I observed one individual deposit eggs in the weather checks in the end of an old dry log. How the young larvae were to enter a seasoned pine log and live is a mystery. On another occasion a female deposited her eggs in a small check on the side of a pine log. The place selected was destitute of bark, though less than six inches away the bark was still on the log.

The specimens taken show a great variety of patterns on the elytra, varying from a few faint spots of yellow on the black background to great splotches, which cover over one-half the surface. The basic color varies from a shiny black to an iridescent green. The length ranges from 15 mm. to 23.5 mm.

13. **Buprestis rusticorum** Kirby.

This species was found rather abundantly in certain situations. Out of 79 specimens collected, 63 were taken feeding on the needles of *Pinus ponderosa*. Many were observed copulating during August and were easily captured by holding a cyanide bottle or other receptacle under them and jarring the limb or twig. When thus disturbed they fold their appendages and drop to the ground. It is not easy to detect them here as they immediately crawl into the grass, under twigs, rocks, or into any convenient hiding place. Another favorite resting place is the sawdust fills. Many were observed crawling around through the coarse sawdust and debris. Breeds in yellow pine and Douglas fir, and occurs in all the northern counties.

14. **Buprestis langii** Mann.

This is undoubtedly the female of *Buprestis fasciata*. A single specimen was taken in flight, July 7, 1915. Dr. Van

Dyke has authentic records of this species being dug from its pupal cells in Douglas fir. It is very probable that it also breeds in yellow pine. They are often seen on the bright green leaves of the poplars and willows, seeking these resting places because of the protection they afford.

15. **Buprestis lauta** Lec. (*B. aruleuta* Linn.)

Probably one of the most common species from Canada to Southern California. This species breeds in Douglas fir, yellow, lodge pole, sugar and Monterey pine, and western red cedar. The last named host is an Oregon record, the author having dug an adult male from a fallen *Thuja plicata* log on the Coast Mountains in April, 1914.

16. **Buprestis confluens** Say.

This is ordinarily a Great Basin species, but Dr. Van Dyke states that it has been taken in the vicinity of Lake Tahoe, California, on one or two occasions. Breeds in poplar.

17. **Buprestis adjecta.**

One taken on an electric light pole July 20, 1915, at Weed. Occurs from Washington to Tulare County, California. Probably breeds in yellow, Jeffrey and lodge pole pine.

18. **Melanophila consputa** Lec.

This species was very numerous and caused considerable annoyance to the men employed about the mill pond by alighting on the neck, hands and arms and biting. Most of the 78 specimens gathered were taken resting on the logs floating in the mill pond, though some were secured from the stacks of cord wood. A most variable species; in markings it varies from solid black to dull bronze and may have from two to fourteen bright or dull yellow spots on the elytra. In size it ranges from 4.5 mm. to 14.75 mm. in length, and from 2 mm. to 5.4 mm. in width. The females are larger than the males, as in most species of this family. Breeds in yellow pine.

19. **Melanophila longipes** Say (*acuminata* De G.)

Twenty-four specimens of this species were taken about the log pond. They were even more of a nuisance than *M. consputa*. Their bite is not just what one would call agree-

able and they cause considerable profanity to float out on the otherwise pure air. Breeds in yellow pine, Douglas fir and the true firs (*Abies*).

20. **Melanophila atropurpurea** Say.*

I have assigned thirteen specimens, taken at Weed, to this species. I must confess, however, that the difference existing between *M. longipes, M. acuminata* and *M. atropurpurea* is almost *nil* in my judgment. The separation I have made is based on the shape of the prothorax and the difference here grades from one extreme to the other until it is a mere guess where one species stops and another begins. Statements under *M. longipes* apply to the species also.

21. **Melanophila drummondi.**

Less common in California than in Oregon. Breeds freely in Douglas fir, grand fir (*Abies grandis*) and to some extent in yellow pine.

22. **Melanophila gentilis** Lec.

This beautiful species was not uncommon, but was rather more active than any of the others and a capture of two specimens out of every five was a good record. Thirty-six specimens were taken; fully one-half of these were taken from the bark or debris on the cars after the logs were unloaded. This species, like *Chalcophora angulicollis,* will rest immovable for hours where they are exposed to the direct rays of the boiling sunshine. In cloudy weather neither species is seen. I find my specimens collected in California are slightly larger and less bright in color than specimens collected by Professor Wickham in Arizona. Breeds in yellow pine. Ralph Hopping states that it also breeds in *P. lambertiana.*

23. **Melanophila** sp.

A peculiar *Melanophila,* which Dr. Van Dyke believes is a western form of *M. pini-edulis* Burke, was taken by him at Carrville, Trinity County, California, in July, 1913, and at McCloud, Siskiyou County, in July, 1914, on yellow pine.

*It is possible that the true *atropurpurea* was not taken and the specimens here mentioned are mere phases of *M. longipes.*

24. **Anthaxia aeneogaster** Lap.

Three specimens of this tiny Buprestid were secured. A pair in copulation was taken on the flowers of the pearly everlasting (*Antennaria sp.?*) and a single female on the dandelion (*Taraxacum officinale* Web.). Dr. Van Dyke has reared specimens from redwood and knobcone pine, and I have reared it from lodge pole pine. It undoubtedly breeds in yellow pine, and has been reported from certain broad leaf trees.

25. **Anthaxia deleta** Lec.

Dr. Van Dyke finds this species common about willows at times. Across the line in Oregon it is taken commonly on blossoms in the yellow pine belt.

26. **Anthaxia sublaevis** Van Dyke. One specimen taken in Siskiyou County, and others in Tuolumne County, California.

27. **Chrysobothris femorata** Fab. Found throughout the State on oak.

28. **Chrysobothris contigua** Lec.

This little *Chrysobothris* was not at all common; five specimens were taken on yellow pine slabwood. They are decidedly more active than most of the other members of this genus. Breeds in smaller limbs of yellow pine.

29. **Chrysobothris dentipes** Germ.

Doctor Horn in his monograph mentions the fact that he has never seen this species from California. I believe it is common in the northern half of the State. Its large size attracts attention at once. Though only 8 specimens were captured at Weed, many more were seen, but unfortunately they were observed at times when it was impossible to capture them. Breeds in *P. ponderosa.*

30. **Chrysobothris californica** Lec.

Dr. Van Dyke gives me the following information concerning this species:

One specimen, Castella, California, (in Blaisdell collection) and two from Nevada County, California (Van Dyke collection); nothing is known of the biology of this rare species.

31. **Chrysobothris caurina** Horn.

This was by far the most common species of the genus found

during the summer. Forty-six specimens were taken. They are very uniform in color and sculpture. Most of the specimens were taken on logs floating in the mill pond. Dr. Van Dyke says of this species: "Probably the most common yellow pine Chrysobothris we have in northern California and eastern Oregon. Farther south in California it becomes scarcer, its place being taken by *C. monticolae* Fall. Undoubtedly breeds in yellow pine."

32. **Chrysobothris monticolae** Fall.

The species has a more delicate color than most of our other western species. It tends towards a lilac, sometimes hinting at a rose tint and in nature has more or less of a white powdery coating which, however, is easily removed by careless handling. Two specimens, July and August. Breeds in lodge pole pine.

Weed is about 200 miles northwest of Lake Tahoe, which is the most northern point hitherto recorded for this species.

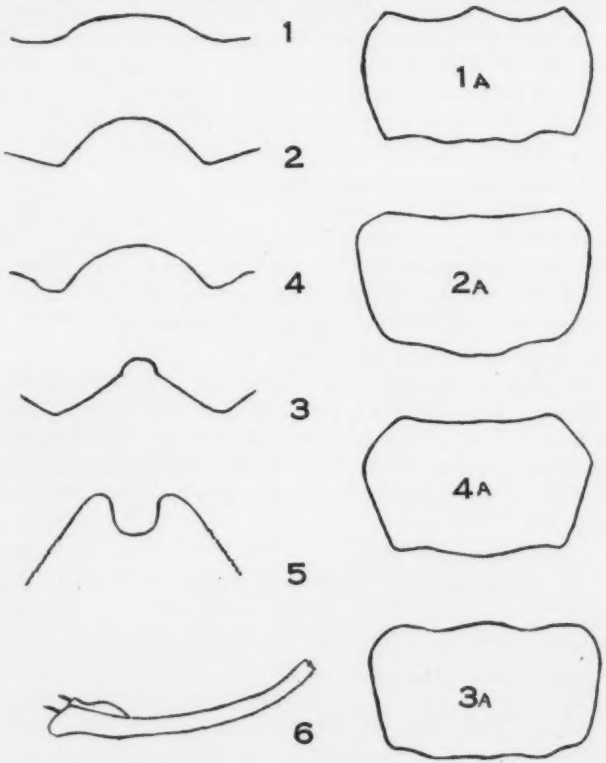
33. **Chrysobothris dolata** Horn.

Two females were taken at Weed in July. Four specimens of this species were taken in Grant County, Oregon, in July, 1914; three are females and the fourth a male. A close study of the six specimens at my disposal shows a wide variation and may possibly include more than one species. The five females exhibit four different forms, which will be more readily understood from the figures than from a printed description. Figure 1 is the clypeus of var A., Fig. 1*a* is the thorax of the same specimen; 2 and 2*a* are clypeus and thorax of var B., etc. Aside from the variation in clypeus and thorax there is little difference in the specimens. The antennae of 1 and 4 are dark cupreous, while 2 and 3 are green; 1 shows no callosites on the front; 1 and 3 are not as densely pubescent as 2 and 4. All show the same sculpture and all are of an iridescent violet color beneath. The prosternum of number 4 is a little more coarsely and deeply punctured than the others. Numbers 2 and 4 are from eastern Oregon, while numbers 1 and 3 are from Weed, California.

As far as I am aware there has never been published a

description of the male of *C. dolata,* which I believe is almost unknown. The following description is made from a single male collected by the author in the Blue Mountains of eastern Oregon, July, 1914:

♂. Has the general appearance of the female as described by Horn. Thorax a little more angulated. Color beneath iridescent, reddish purple, antennae dark purple, basal joints slightly greenish, much heavier and with less taper than the female and the last four joints have a squarish appearance, third joint about as long as next two, not



Chrysobothris dolata Horn.—Figs. 1 to 4.—Clypei of females. Figs. 1a to 4a.—Thoraces of females. Fig. 5.—Last ventral segment of male. Fig. 6.—Anterior tibia of male.

longer. Front as described by Horn, slightly pubescent, clypeus with a triangular oval emargination at middle, arcuate on each side. (This is exactly as Horn describes the female). I find that the clypeus of the females varies considerably in all specimens I have seen but is usually as shown in Figures 1 and 2. Thorax more angulated than one would surmise from Horn's description, though fitting his figure admirably; two depressions each side of middle and a third one near the margin, center (I fail to find the crescentic or oblique depressions of Dr. Horn) coarsely punctured, the punctures running together transversely, giving a strigilated appearance. Elytra same as female, prosternum not lobed, coarsely and closely punctate, margin of last ventral (Fig. 5) serrate; tip deeply, semi-circularly emarginate, the emargination deeper than wide. Anterior tibia dilated at end as shown in Fig. 6. Length 13 mm.

A single male taken in Grant County, Oregon, July 21, 1914, on lodge pole pine (*P. contorta*). This species probably breeds in *P. contorta, P. lambertiana* and *P. ponderosa.*

34. **Chrysobothris pseudotsugae** Van Dyke.

One specimen taken in August. This species bears a close resemblance to *C. caurina,* but is smaller and darker. The prosternum being lobed will at once separate it from *caurina.* Taken on *Abies grandis,* grand fir, at Weed, August 11, 1915. Hopping has taken this species from *P. ponderosa.*

35. **Chrysobothris laricis** Van Dyke.

This species described from a series collected by the author in eastern Oregon on larch and lodge pole pine, and has been taken in the lodge pole pine belt above Lake Tahoe and in Tuolomne Meadows, California. It no doubt will be found in the higher Cascade and Sierra Ranges from Oregon to Central California.

36. **Chrysobothris nixa** Horn.

This species is fairly common in northern California and ranges over into the southwestern portion of Oregon. Breeds so far as known only in incense cedar (*Libocedrus decurrens*).

37. **Chrysobothris viridicyanea** Horn.

This beautiful green species breeds in the limbs and smaller branches of *Libocedrus decurrens* and is found in most of the northern counties of the State. The following counties are represented in Dr. Van Dyke's collection: Trinity, Siskiyou and Placer. I have two specimens from Siskiyou County.

38. **Chrysobothris sylvania** Fall.

The type material was collected from apple in northern Sonoma County, California. Mr. Nunenmacher, of Oakland, has taken it in Del Norte County. I have collected it in the Cascades of southern and central Oregon. A number of specimens were dug from the sapwood of Douglas fir, March, 1916.

39. **Chrysobothris mali** Horn.

Occurs throughout California, where it breeds in cherry, willow and oak. In Oregon the writer has bred it from prune, peach and apple.

40. **Chrysobothris pubescens** Fall.

I have a single specimen of this species taken in southern Oregon. Dr. Van Dyke states that in California it is generally confined to the Sierras. He has taken it at Lake Tahoe and in Shasta County. There are specimens in his collection from Reno, Nevada and from Tulare County, California. It probably breeds in the smaller limbs of Jeffrey and yellow pine.

41. **Chrysobothris deleta** Horn.

This is not a typically northern species, but does occur at rare intervals, as shown by a specimen from Lake Tahoe and one from Castella, Shasta County, July 8, 1912 (in the Van Dyke collection).

42. **Chrysobothris cyanella** Horn.

This species although rare is rather widely distributed throughout the Cascade-Sierra region. The writer has taken specimens in the vicinity of Ashland, Oregon (just over the California line). It undoubtedly breeds in the twigs of yellow pine. In the Van Dyke collection there are specimens taken in Shasta County, Siskiyou County, and Lake Tahoe, California.

43. **Chrysobothris prasina** Horn.

The type of this species is supposed to have been collected in northern California. Dr. Van Dyke has one specimen taken in Sonoma County, June 30, 1912.

(To be continued.)

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., MARCH, 1917.

Specialization in Entomology.

Are there any readers of the NEWS who still read *The Poet at the Breakfast Table* and recall this piece of conversation, which *The Entomologists' Monthly Magazine* (London) printed as a motto on the title page of its fifteenth volume for 1878-79?

I suppose you are an entomologist?

Not quite so ambitious as that, sir. I should like to put my eyes on the individual entitled to that name. No man can be truly called an entomologist, sir; the subject is too vast for any single human intelligence to grasp.

There were entomologists, just as there were giants, in former days. Linnaeus was more than an entomologist. Fabricius, Latreille, Leach, Westwood and Burmeister were entomologists. In later years, however, we have specialized still more narrowly, except when we are entomologists by compulsion. Not only do we have lepidopterists, but also microlepidopterists, nay, erycinidists and even catocalists. We are not sure whether there are not those who limit themselves to the study of a single *species*, which is certainly the case among those devoted to mammals.

It is interesting to see how the journals have tried to keep pace with specialization. *Papilio*, the organ of the New York Entomological Club, fluttered for four volumes from 1881 to 1884. The late F. W. Konow sustained the *Zeitschrift für systematische Hymenopterologie und Dipterologie* from January 1, 1901, to May, 1908, but it did not long survive its editor. *Entomologische Blätter, Zeitschrift für Biologie und Systematik der Käfer* (Berlin), has appeared from 1905 down to

at least December, 1915. In general it seems that the number of specialists in any one or two orders of insects is not sufficient to support a special journal, and we know of none such provided with an endowment fund guaranteeing its permanency. In this matter we must still be entomologists, apparently, and yet the record of general entomological journals contains many a short-lived periodical. We have only to recall *The American Entomologist* of three volumes, 1868-1880, and *Entomologica Americana*, of six volumes, 1885-1890.

Questions and Answers.

The NEWS invites those having any entomological questions which they wish answered to send such in for publication under this heading, and also invites answers from its readers or others to these questions. Questions and replies should be as brief as possible and the Editors reserve the right not to publish any of either class which seem to them objectionable or inappropriate. Those sending in contributions to this department will please indicate whether they wish their names or merely one or more initials to appear in connection with their communications, but all such must be accompanied by the full name and address of the writer for the information of the editors.

QUESTION No. 5.—Are there any recorded aberrations of *Melitaea brucei* or *Phyciodes camillus* which have received names? We are so far removed from entomological libraries that it is impossible to obtain this information here.—DR. JOHN A. COMSTOCK, 1275 Bellevue Avenue, Los Angeles, California.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—The Canadian Entomologist. **5**—Psyche. **6**—Journal, New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **10**—Nature, London. **11**—Annals and Maga-

zine of Natural History, London. **34**—Proceedings, Iowa Academy of Sciences, Des Moines. **50**—Proceedings, U. S. National Museum. **68**—Science, New York. **69**—Bolletino, Societa Italiana Entomologica. **128**—Proceedings, Linnean Society of New South Wales, Sydney. **153**—Bulletin of the American Museum of Natural History, New York. **180**—Annals of the Entomological Society of America. **334**—Proceedings of the American Academy of Arts and Sciences, Boston. **406**—Boletin del Museo Nacional de Chile, Santiago de Chile. **407**—Journal of Genetics, Cambridge, England. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. **449**—British Museum (Natural History) Publications, London. **486**—Journal, Elisha Mitchell Scientific Society, Chapel Hill, N. C. **538**—Lorquinia, Los Angeles. **540**—The Lepidopterist. Official Bulletin, Boston Entomological Club. **543**—Genetics, Princeton, N. J. **544**—Miscellanea Entomologica. **545**—Proceedings, Entomological Society of British Columbia, Vancouver.

GENERAL SUBJECT. Crampton, G. C.—The orders and relationships of Apterygotan insects, **6,** xxiv, 267-301. **Dyar, H. G.**—A psychological locality, **420,** iv, 131-2. **Joutel, L. H.**—Biographical notice by W. T. Davis, **6,** xxiv, 239-43. **Kenoyer, L. A.**—Insect pollination of timberline flowers of Colorado; Insect pollination of Frasera stenosepala, **34,** xxiii, 483-86; 487-8.

PHYSIOLOGY AND EMBRYOLOGY. Hyde, R. R.—Two new members of a sex-linked multiple (sextuple) allelomorph system (Drosophila), **543,** i, 535-80. **Hyde & Powell.**—Mosaics in Drosophila ampelophia, **543,** l, 581-83. **Metz, C. W.**—Mutations in three species of Drosophila, **543,** i, 591-607. **Safir, S. R.**—Buff, a new allelomorph of white eye color in Drosophila, **543,** i, 584-90.

MEDICAL. Cummings, B. F.—The louse and its relation to disease; its life-history and habits; how to deal with it, **449,** Econ. Ser., No. 2.

ARACHNIDA, ETC. Emerton, J. H.—Recent studies of Canadian spiders, **4,** 1917, 13-16. **Newman, H. H.**—A case of synchronic behavior in Phalangidae, **68,** xlv, 44.

Ewing, H. E.—New Acarina. Part II.—Descriptions of n. sps. and var. from Iowa, Missouri, Illinois, Indiana and Ohio, **153,** xxxvii, 149-172. **Hirst, S.**—On some new mites of the suborder Prostigmata living on lizards [1 n. gen.], **11,** xix, 136-143. **McGregor, E. A.**—Descriptions of seven n. sps. of red spiders [4 new], **50,** li, 581-90.

NEUROPTERA, ETC. Rich, S. G.—Some respiratory structures of dragon-fly larvae, **6,** xxiv, 306-7. **Tillyard, R. J.**—Further observations on the emergence of dragon-fly larvae from the egg, **128,** xli, 388-416.

ORTHOPTERA. Giglio-Tos, E.—Mantidi esotici, **69,** xlvii, 1-44.

Morse, A. P.—A New England orthopteran adventive, **5,** 1916, 178-80.

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LEPIDOPTERA. Cockle, J. W.—Notes on the habits of some L., **545,** No. 5, 91-4 (1915). **Day, G. O.**—Notes on the early stages of Calocampa cineritia; Notes on the early stages of Epirrita dilutata, **545,** No. 5, 86-7; 95-6 (1915). **Figueroa, C. S.**—Los cosidos de Chile, **406,** viii, 49-55. **Forbes, W. T. M.**—On the Tympanum of certain L., **5,** 1916, 183-92. **Harrison, J. W. H.**—A further probable case of sex-limited transmission in L., **10,** xcviii, 248. Studies in hybrid Bistoninae, **407,** vi, 94-161. **Thierry-Mieg, P.**—Descriptions de lepidopteres nouveaux, **544,** xxiii, No. 10-11. **Wolden, B. O.**—The white admiral or banded purple butterfly in Iowa, **34,** xxiii, 269.

Reiff, W.—Catocala amica subsp. novangliae; Additions to the paper on Catocala amica; Colias philodice f. nigro-fasciata, **540,** i, 12-15; 21; 22-23. **Swett, L. W.**—Geometrid notes: New species from California [1 new], **540,** i, 10-11.

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1916, 159-63. **Knab, F.**—Further notes on Syrphidae, **420,** iv, 133-5. **MacGregor, M. E.**—Calliphora vomitoria captured by an oyster, **8,** 1917, 18-19. **Metcalf, C. L.**—A list of Syrphidae of North Carolina, **486,** xxxii, 95-112. **Parker, R. R.**—Notes concerning Gastrophilus haemorroidalis, **6,** xxiv, 253-5. **Porter, C. E.**—Descripcion de un nuevo diptero chileno (Agromyza gayi), **406,** viii, 56-7. **Richardson, C. H.**—The attraction of D. to ammonia, **180,** ix, 408-413.

Alexander, C. P.—New nearctic crane-flies. Part II. [9 new], **4,** 1917, 22-31 (cont.). **Brues, C. T.**—A new sp. of Apiochaeta from New England (Phoridae), **5,** 1916, 175-6. **Sturtevant, A. H.**—Notes on N. Am. Drosophilidae with descriptions of 25 n. sps., **180,** ix, 323-43. **Townsend, C. H. T.**—Miscellaneous muscoid notes and descriptions [8 n. gen.; 4 n. sps.]; Lithohypoderma, a new fossil genus of oestrids, **420,** iv, 121-28; 128-30.

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Liljeblad, E.—New sps. of C. of the genus Mordellistena [8 new], **4,** 1917, 9-13. **Schaeffer, C.**—New sps. of the family Elateridae [19 new], **6,** xxiv, 256-67.

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☞ **These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued**

Wanted—Rare Buprestidae. Have *B. connexa* to exchange for *B. sulcicollis* or other equally rare species.—W. J. Chamberlin, Ore. Exp. Sta., Corvallis, Ore.

Wanted—Kirby, Catalogue of Odonata; Literature on South African Odonata. African insects in exchange, or cash.—Stephen Rich, Amanzimtoti, Natal, South Africa.

Wanted—To correspond with collectors in India, China, Japan, Africa and all parts of the tropics who can furnish Lepidoptera from their own territories, either in large or small lots.—S. C. Carpenter, 92 Baltimore St., Hartford, Conn.

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v. *viennensis* Kr.
violaceus Linn.
galicianus Gory.
rugosus Fabr.
v. *baeticus* Deyr.
ullr chii Germ.
v. *superbus* Kr.
kollarii Pall.
striatulus Gebin.
lindemannii Ball.
bogdanowii Ball.
v. *turkestanicus* Heyd.
stschurovskyi Solsky.
linneii Panz.
cribratus Quens.
glabratus Payk.
Eurynebria
complanata Linn.
Nebria
picicornis Fabr.
tatrica Mill.
Pelophila
borealis Payk.
Blethisa
multipunctata Linn.
Scarites
laevigatus Linn.
Broscus
cephalotes Linn.
Craspedonotus
tibialis Schaum.
Dellomerus
tatricus Mill.
Chlaenius
spoliatus Rossi.
vestitus Payk.
festivus Fabr.
Licinus
silphoides Rossi.
Siagona
europaea Dej.
Graphipterus
rotundatus Klug.
Anthia
sexmaculata Fabr.
Acinopus
picipes Oliv.
Aristus
capito Dej.
Ditomus
dama Rossi.
Pachycarus
caeruleus Brulle.
brevipennis Chaud.
Penthus
tenebroides Waltl.
Liochirus
cycloderus Solsky.
Scybalicus
oblongiusculus Dej.
Ophonus
cephalotes Fairm.
Gynandromorphus
etruscus Quens.
Diachromus
germanus Linn.
Pseudophonus
pubescens Mull.
hospes Sturm.
Pardileus
calceatus Duft.
Harpalus
namanganensis Heyd.
aeneus Fabr.
psittacinus Four.
dimidiatus Rossi.
serripes Quens.

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